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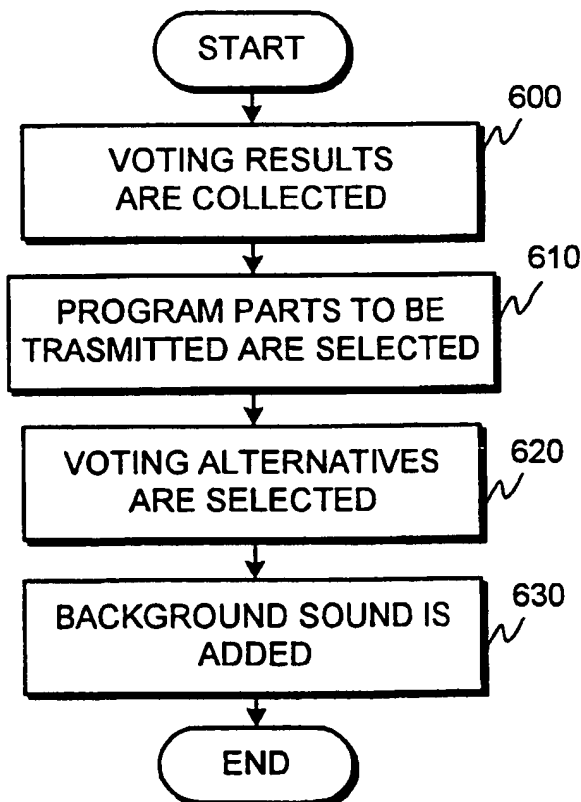
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(54) Title: PRODUCING SYSTEM OF INTERACTIVE TELEVISION PROGRAM



(57) Abstract: The invention relates to the production of in-
teractive television programs. In the system of the invention,
there is a result unit for collecting the voting results, a control
unit for selecting the program parts at least partly on the basis
of the collected voting results, a program unit for combining
the program parts according to the control of the host unit, and
recording means for recording the program parts.

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Producing system of interactive television program

Object of the invention

The invention relates to the production of interactive television programs. The
5 invention especially relates to the system according to the preamble of claim 1.

Description of the technical background

Many kinds of systems are previously known, which offer the viewers of TV-
programs a possibility to influence the program. However, the state-of-the-art
systems are very restricted, and thus, the feedback of the viewers has mainly
10 been used in different kinds of trivia shows, music competitions and similar
program types.

Short description of the invention

The object of the invention is to provide a system, which makes it possible to
realise an interactive television program. Further, it is the object of the invention
15 to provide a system, which makes it possible for the viewers to influence the
progress of the program in a more versatile way than in the solutions of the state
of the art. It is also the object of the invention to provide a system, which makes
it possible for the viewer to influence the progress of the plot of the program.

These objects are achieved by providing a system, which composes the trans-
mitted program from program parts, such as video and audio cuts, at least partly
20 on the basis of the voting results of the viewers.

The system of the invention is characterised in what is disclosed in the character-
ising part of the independent claim concerning the system. The method of the
invention is characterised in what is disclosed in the characterising part of the
25 independent claim concerning the method. The computer program product of the
invention is characterised in what is disclosed in the characterising part of the
independent claim concerning the computer program product. The dependent
claims describe other advantageous embodiments of the invention.

Short description of the figures

The invention is next described in more detail referring to the advantageous embodiments presented as examples, and to the enclosed drawings in which:

Figure 1 is the block diagram of the system according to an advantageous embodiment of the invention;

Figure 2 illustrates the flow diagram of the method according to an advantageous embodiment of the invention; and

Figure 3 presents the flow diagram of the computer program product according to an advantageous embodiment of the invention.

Same reference numbers and markings are used of corresponding parts in the Figures.

Detailed description of advantageous embodiments of the invention

A. A first set of advantageous embodiments of the invention

In Figure 1, there is disclosed the block diagram of the system according to an advantageous embodiment of the invention, and other equipment related to the system.

Figure 1 illustrates a telephone voting system 30 and WWW (World Wide Web) voting system 40, with the help of which viewers can vote predetermined voting alternatives. The result unit 100 collects the voting result data from the telephone and www voting systems 30 and 40, and relays the result data to the control unit 200. The control unit selects, at least partly on the basis of the voting result data, the program parts to be transmitted next, and controls the program unit 300 to compose the program to be transmitted from the program parts. For recording the program parts, the system comprises one or several storage mediums. In the example of Fig. 1, the program unit 300 forms the program to be transmitted from the recorded program parts on the video server 400 and audio server 410. The program flow formed by the program unit 300 is transmitted to the broadcasting centre 500, in which the program flow can still be processed for the broadcast, if necessary. The program generated as the final result is transmitted to viewers with the help of transmission systems 50. Figure 1 further discloses the television 10, telephone 12 and computer 11 of the viewer of the television

program. The telephone 12 is connected to the telephone service system through the public telephone network 21 (PSTN, public switched telephone network), and the computer 11 is connected to the www voting service system 40 through a public data network, such as the Internet 22.

- 5 It has to be noted that the functional blocks in Figure 1 can be realised in many different ways in one or several physical devices. Because the major part of the functions of the system can be realised software-based, the functional blocks in Figure 1 can be grouped into one or several computer systems in many different ways. For example, the functions of the result unit 100, control unit 200 and
- 10 program unit 300 can be realised with the help of one sufficiently efficient computer system. Thus, the invention is not restricted to any particular hardware configuration, because the hardware configuration for a particular subject of embodiment of the invention is dependent on the functional requirements and limitations characteristic of the subject of embodiment in question.
- 15 The control unit 200 sees to the formation of the television program. For this purpose, the control unit 200 comprises control software, which is responsible for the playing of the whole program and for the formation of the program flow in real time or almost real time according to the situation of the program at given time, preferably at least partly according to a predetermined set of rules. The
- 20 control software searches the suitable video and audio program parts from the program part database, and forms scenes and larger program unities from the program parts. The said predetermined set of rules may comprise, for example, various alternatives for the behaviour and states of mind of the main characters in different situations and, for example, different alternatives for the progress of the
- 25 plot of the program. In different stages of the program, the set of rules may also control the possibilities of the viewers' vote to influence the progress of the program and, in some situations, to allow the program to proceed completely according to the vote of the viewers, but in some other situations, to restrict the possible progress routes of the plot. The set of rules may also likewise control the
- 30 influence of randomness on the progress of the program, and to direct the control unit to select the next program parts completely at random in some certain situations, or for example, partially at random in addition to the effect of the viewers' voting results. In addition, the control software preferably records the course of events of the program so that the contents of the generated program
- 35 may also be viewed afterwards.

In an advantageous embodiment of the invention, the telephone voting system, www voting system or some other similar voting system plays monologues or conversations of the main characters to the callers, thus providing background for the voting situation. The control unit selects the monologues or conversations to
5 be played in connection with the selection of the voting alternatives, and as in case of voting alternatives, it also changes the monologues or conversations according to the progress of the program. Such monologues or conversations can be used to relay further information about the state of mind and range of thoughts of the main characters at given time.

10 **B. A second set of advantageous embodiments of the invention**

The formation, recording and classification of program parts for enabling the automatic processing and selection are next described by way of an example. It has to be noted that the following description is only one example of the possible ways for arranging the program parts, and the invention is not limited only to the
15 examples disclosed next.

The program production mode of the invention naturally requires that a large number of program parts be prepared beforehand. These program parts have to be classified and described in a very detailed way, so that they can be automatically combined according to the viewer's votes and other control factors
20 with the help of the control unit.

Thus, the raw material filmed from the actors' work can be processed, for example, in the following way, which deviates considerably from the usual television production. The filmed material is gone through, and the dramaturgically and editably independent parts are separated from it. The exact
25 time for the starting and ending points of the independent parts is recorded. The material is edited so that it forms a unity of different moods and operation strategies of the actor within a scene with similar contents and narration. In other words, editing is carried out so that the result of the editing supplies different variations of the actor's work of the same situation. The variations may be
30 formed, for example, at two levels:

- At a coarse level: a totally different action in the same situation, for example, in different moods, which may comprise, for example, anger, sorrow, fear, retiring into oneself, and other moods.

- Variations of more subtle action models within the same emotional and active strategy.

In this way, a large number of video clips, i.e. program parts, is formed from one scripted basic situation.

- 5 The formed program parts are classified for future use. Each program part is classified on the basis of its different technical properties and contents. The classification is added into a database containing also other information about the program parts, such as the starting and ending times for the program parts in a certain file containing the original tape. The purpose of the exact classification
- 10 system is to make it possible to programmatically process the material unity including thousands, tens of thousands, or even more clips, in real time or almost real time.

The properties of the program part can, for example, be classified with the following information, which is used in the system of an embodiment of the

15 invention in the realisation of a program production:

- consecutive numbering of clips according to the raw material scenes, numbered respectively;
- number of the original tape;
- material information (video/audio, tracks)
- 20 - time codes, starting/ending point;
- picture size;
- direction of look, left/right;
- panning during the picture, its direction;
- zoom during the picture, opening/closing;
- 25 - location of the picture situation, who is in the picture;
- weather conditions;
- the dramatic nature of the actor's action: charging or discharging;
- emotional intensity of the picture action on a scale, for example 1 – 3;
- the actor's awareness and relation to the camera, i.e. the viewer: does not
- 30 know/is afraid/knows but does not care/takes direct contact;
- the suitability of music or respective audio world emphasising the action, combined with the clip; this information may also include the character of the desired audio material;
- the clip being part of the channel system of the scene, built on the grounds of
- 35 contents; its membership in one or several channels;

- the suitability of the clip as starting or end picture of the scene to be built;
- the actor's location in relation to the camera: for example, his/her back to the camera;
- picture composition, for example, horizontal/vertical;
- 5 - clip length;
- room space or other place in the picture;
- explicit written description of the action and situation.

This list is only an example of an exemplary production according to a form of embodiment, and it does not restrict the invention in any way. In other forms of
10 embodiment, the information to be recorded from program parts may comprise more or less information than the list presented above, and they may be in a different order.

The set of rules used in the program production according to an advantageous embodiment of the invention for the classification and use of program parts is
15 next described. In this embodiment, the program parts have a multi-layer hierarchy, which influences the selection of program parts on the basis of the viewers' voting results. Clips, i.e. program parts, are at the lowest level of the hierarchy. The clips have been classified beforehand in the way described above.

At the second level of hierarchy there are the channels, consisting of clips
20 representing the similar narrative line, direction of action, or motivation. Each clip of the database thus belongs to at least one channel. Thus, the different channels form, for example, the emotional or technical variation of one actor's work.

The third level of hierarchy consists of the sequences, which are interactive
25 scenes, the structure of which has been predetermined at least to some extent. Interactive scenes, which are called sequences, are included in the plan of a finished interactive program. The length of the cloud is preferably about 3 – 15 minutes. The sequence is a clearly distinguishable, independent sequence of the program. In an exemplary embodiment, the sequence is determined to include
30 two parts:

- The sequence comprises a first part, utilising the so-called main channel and secondary channel. Of the channels defined into the database, one is chosen as the main channel and some other channel as secondary channel. The share of the

main channel, i.e. the principal form of action in the first part, may be, for example, 80% or more of the duration of the first part. The rest is formed from clips of the secondary channel, which may convey to viewers, for example, different images somehow relating to the action of the main channel. The selection of clips from the main and secondary channel may be controlled by many kinds of rules, within the limits set by which the control unit picks out one by one a number of clips set on the basis of the sequence in random order from the group of clips, thus forming the first part of the sequence.

- Besides the first part, the sequence comprises a latter part, formed by a predetermined number of alternative continuation items. Each continuation item may advantageously correspond to a certain channel, the activity descriptions corresponding to which the viewers have been able to vote during the first part.

The progress of the preceding sequence may also advantageously influence the activity forms of the next sequence, i.e. the selection of the theme for the first part of the next sequence.

An example of the operation principles of the control unit in the coarse level control of the program, i.e. the selection of contents of the sequences, will be described next. In this example, the progress of the program is based on the two-dimensional description of the program structure. This description is here called the sequence map. On the different axes of the sequence map, there are the two different dimensions of the contents of the program, such as the dimensions of the emotional life of a main character. For example, the dimension introvert – extrovert may be on the one axis and the dimension sound personality – shattered, broken personality – on the other. The dimensions of the sequence map may also be selected in many other ways, and the number of dimensions of the sequence map used may also be something else besides two, for example, one or three. Pre-prepared sequences are placed onto the sequence map, for example, into a location according to the contents of the main channel of the sequence. During the progress of the program it is deducted on the basis of the viewers' voting results, in which direction on the map and how far away from the starting point of the current sequence one will go. In this case, the direction is determined by the activity alternatives voted, and the length by the number of votes. The sequence to be transmitted next will be the one the starting point of which is closest to the thus found location on the sequence map. Each main principal

character of the program may have his/her own sequence map so that the activity of the main characters may be directed independently, irrespective of each other.

C. A third set of advantageous embodiments of the invention

User interface solutions according to some advantageous embodiments of the invention will be described next. In these user interface solutions, certain data is added to the program to be transmitted, such as voting alternatives and respective telephone numbers, which the viewers may utilise when voting for different alternatives of action. In these user interface solutions, the elements of the user interface are added onto the video picture. The user interface consists of instructions of use, for example of the telephone number and voting alternatives of the voting service relating with the main character. The user interface also preferably includes data about the votes given by other viewers. The voting situation is preferably updated at sufficiently short intervals so that the viewers are given almost real-time feedback of the selections of all the viewers. According to an advantageous embodiment of the invention, the user interface indicates the contents of the most voted alternative in graphic form, the least voted alternative in graphic form, and in addition, as the sequence ends, the user interface indicates as text the name and/or contents of the action that received the largest number of votes during the cloud. This gives all the viewers clear data about the nature of the next sequence of the main character, and attracts interest to it. In addition, it is possible for the viewers to interpret the contents of the sequence in the reference frame supplied by the vote result. However, the variety and interpretativeness of the contents of the program are not bound with the monitoring of the status of the main characters, but the meters presented by the user interface are preferably of a coarse nature, leaving room for interpretation, but however, operating in a logic way.

D. A fourth set of embodiments of the invention

According to a viewpoint of the invention, the invention idea has been realised as a system for producing an interactive television program. According to an advantageous embodiment of the invention, the system comprises a result unit for gathering the voting results, a control unit for selecting the program parts at least partly on the basis of the collected voting results, a program unit for combining the program parts according to the control of the host unit, and recording means for recording the program parts.

According to an advantageous embodiment of the invention, the control unit comprises means for selecting the program parts at least partly on the basis of the collected voting results and at least partly on the basis of a predetermined set of rules.

- 5 According to an advantageous embodiment of the invention, the system also comprises means for implementing the viewers' vote, and the control unit comprises means for selecting the voting alternatives for the viewers' vote, at least partly on the basis of the selected program parts.

- 10 According to an advantageous embodiment of the invention, the said means for implementing the viewers' vote comprise means for realising the telephone service system.

According to an advantageous embodiment of the invention, the said means for implementing the viewer's voting comprise means for realising a voting system utilising a public data network.

15 **E. A fifth set of advantageous embodiments of the invention**

- Figure 2 illustrates a method of an advantageous embodiment of the invention for producing an interactive television program. According to an advantageous embodiment, the method comprises steps, in which voting results are collected 600 from the viewers of the said interactive television program, the program parts to be transmitted are selected 610 at least partly on the basis of the collected voting results for forming a line of program parts to be transmitted, and new voting alternatives are selected 620 at least partly on the basis of the said selected program parts.

- 25 According to an advantageous embodiment of the invention, in step 610, in which the program parts to be transmitted are selected, the selection is also carried out at least partly at random.

- 30 According to an advantageous embodiment of the invention, in step 610, in which the program parts to be transmitted are selected, the selection is also carried out at least partly on the basis of a predetermined set of rules. Such a set of rules may advantageously comprise a coarse description of the progress of the plot of the program and of certain limits, within which the contents of the program are changed according to the vote of the viewers.

According to an advantageous embodiment of the invention, the method also includes a step, in which background sound is added 630 to the said line of program parts on the basis of a second predetermined set of rules. For example, the database comprising the program parts advantageously contains information about the atmosphere of the program part in question so that this information may influence the selection of the background music of the program on the basis of such a second predetermined set of rules. The principal purpose of the said second predetermined set of rules is to make sure that the created background sound scenery follows sufficiently closely the composition formed from the video program parts but, however, forming a continuous unity, which has no disturbing breaks or changes in tone.

According to an advantageous embodiment of the invention, in the said step in which voting results are collected 600 from the viewers of the said interactive television program, the voting results are collected at least partly with the help of a telephone voting system.

According to an advantageous embodiment of the invention, in the said step, in which voting results are collected 600 from the viewers of the said interactive television program, the voting results are collected at least partly with the help of a voting system utilising a public network.

F. A sixth set of advantageous embodiments of the invention

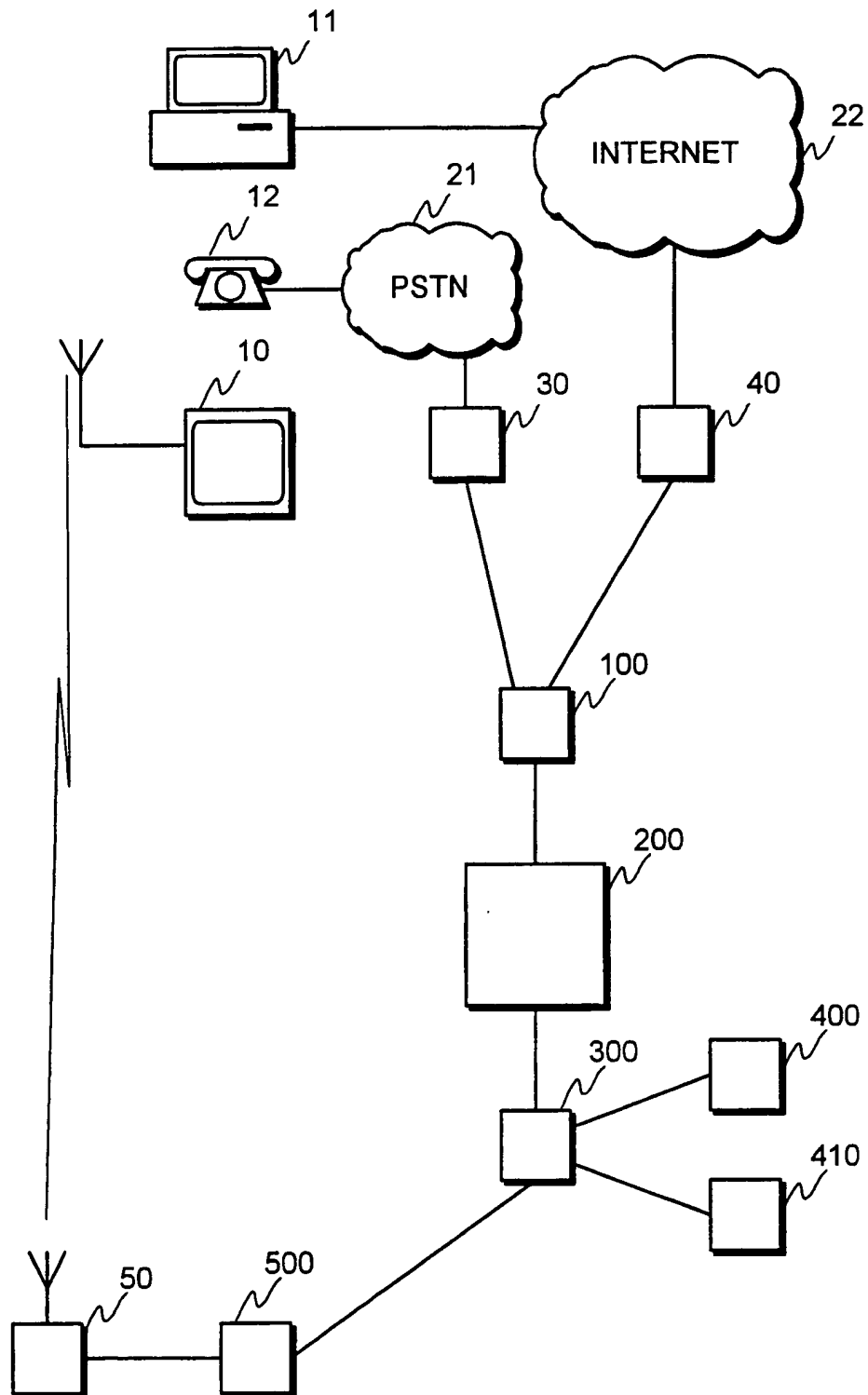
According to some advantageous embodiments of the invention, the basic features of the invention are carried out with the help of a computer program. Figure 3 illustrates such an embodiment. Figure 3 illustrates the structure of a computer program product 700. The computer program product is suitable as software realising the most important functions of the control unit in the production system for an interactive television program. According to an advantageous embodiment of the invention, the computer program product 700 comprises program code means 710 for receiving the voting results, program code means 720 for selecting the program parts for the television program at least partly on the basis of the received voting results, program code means 730 for selecting the program parts for the television program at least partly on the basis of the collected voting results and at least partly on the basis of a predetermined set of rules, and program code means 740 for selecting the voting results of the viewer voting at least partly on the basis of the selected program parts. The

- program code means 710 for receiving the voting results may, for example, comprise means for receiving and processing the voting result files generated by the telephone service system and www server system. The program code means 720 for selecting the program parts for the television program may advantageously comprise means, which select the program parts to be transmitted next from the program parts recorded into the program part database on the basis of the predetermined set of rules and the voting results. The program code means 740 for selecting the voting alternatives for the viewers' votes may advantageously comprise, for example, means for selecting the voting alternatives from a database of predetermined voting alternatives and means for relaying the selected voting alternatives to the voting systems. Such a computer program product may be realised in many different forms, such as, for example, a finished application software or, for example, a subroutine library for implementing the control software. Such a computer program product may also be relayed from one user to another in many different ways, for example, as a translated binary code or source code. The computer program product may also be stored in many different mediums, such as a magnetic, optical or magneto-optical storage medium, or in an electrical memory, such as a computer RAM memory (random access memory).
- In this application and especially in the enclosed claims, the term television program is used only for the reason of clarity, and the invention is not limited to the production of programs to be watched from television, only. As is well known for one skilled in the art, television programs, or more generally described, programs based on live picture in wide distribution, can be watched with many other systems and equipment besides television, for example, using a data projector, computer and computer monitor, and such programs may also be relayed in many different ways, such as by radio, cable, or for example, using the multicast transmission mode of the Internet.

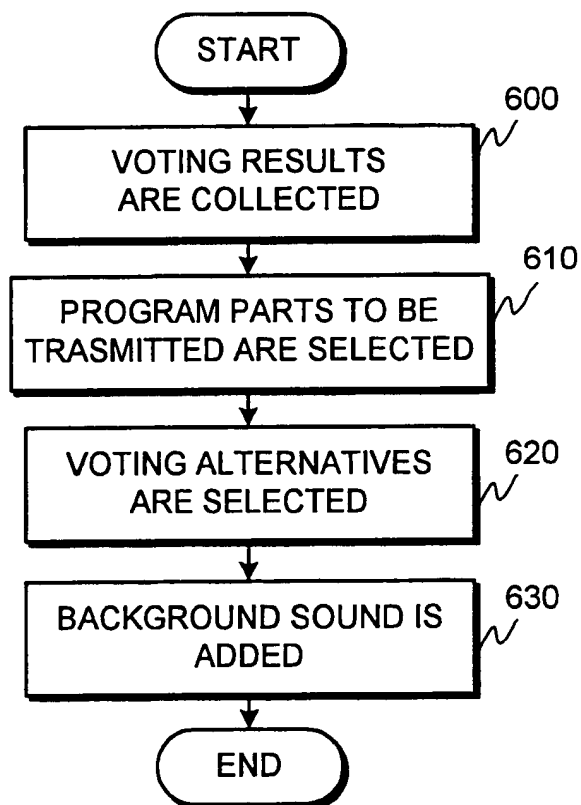
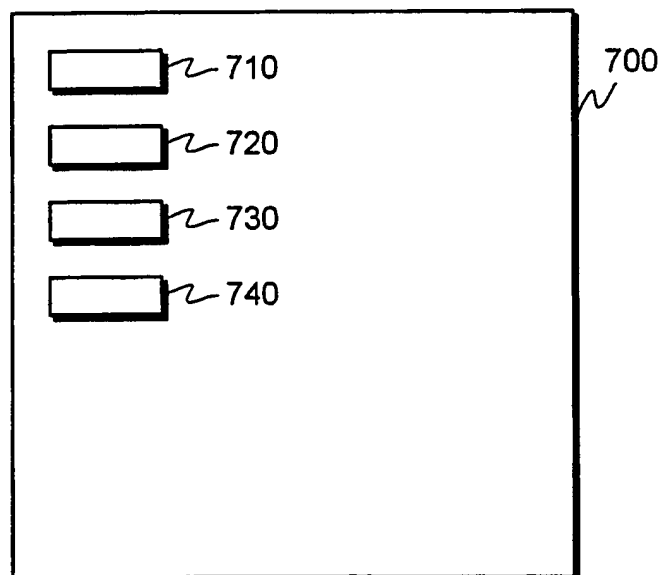
Claims

1. System for producing interactive television program, characterised in that it comprises
 - a result unit for collecting the voting results;
- 5 - a control unit for selecting the program parts at least partly on the basis of the collected voting results;
- a program unit for combining the program parts according to the control of the host unit; and
- recording means for recording the program parts.
- 10 2. System according to claim 1, characterised in that the control unit comprises means for selecting the program parts at least partly on the basis of collected voting results, and at least partly on the basis of a predetermined set of rules.
3. System according to claim 1, characterised in that it comprises
- 15 - means for realising the viewers' vote;
- means in the control unit for selecting the voting alternatives for the viewers' vote at least partly on the basis of the selected program parts.
4. System according to claim 1, characterised in that the said means for realising the viewers' vote include means for realising a telephone service
- 20 system.
5. System according to claim 1, characterised in that the said means for realising the viewers' vote include means for realising a voting system utilising a public data network.
6. Method for producing interactive television program, characterised in that
- 25 it comprises the steps, in which
 - voting results are collected from the viewers of the said interactive television program;
 - program parts to be transmitted are selected at least partly on the basis of the collected voting results for forming a line of program parts to be transmitted; and
 - 30 - new voting alternatives are selected at least partly on the basis of the said chosen program parts.

7. Method according to claim 6, **characterised** in that in the step, in which program parts to be transmitted are selected, the selection is carried out at least partly also at random.
8. Method according to claim 6, **characterised** in that in the step, in which
5 program parts to be transmitted are selected, the selection is also carried out at least partly on the basis of a predetermined set of rules.
9. Method according to claim 6, **characterised** in that it also includes a step, in which background sound is added to the said line of program parts according to a second predetermined set of rules.
10. Method according to claim 6, **characterised** in that in the said step, in which voting results are collected from the viewers of the said interactive television program, the voting results are at least partly collected with the help of a telephone voting system.
11. Method according to claim 6, **characterised** in that in the said step, in
15 which voting results are collected from the viewers of the said interactive television program, the voting results are at least partly collected with the help of a voting system utilising a public data network.
12. Computer program product for implementing a system controlling the formation of an interactive television program, **characterised** in that it
20 comprises
- program code means for receiving the voting results;
 - program code means for selecting the program parts for the television program at least partly on the basis of the received voting results;
 - program code means for selecting the program parts for the television program
25 at least partly on the basis of the collected voting results and at least partly on the basis of a predetermined set of rules; and
 - program code means for selecting the voting alternatives for the viewers' vote at least partly on the basis of the selected program parts.

**Fig. 1**

2 / 2

**Fig. 2****Fig. 3**

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 01/00194

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04N 7/14, G07C 13/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04N, G06F, G07C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	'Du bestämmer' [online] [retrieved on 2001-07-11] Retrieved from the Internet: <URL:http:// www.torget.se/users/n/nozick/du_best.html> --	1-2
Y	'Vocé decide' TV Globo Ltda. [online] [retrieved on 2000-07-11] Retrieved from the Internet: <URL: http://redglobo1.globo.com/vocedecide/> --	1-12
Y	US 4151370 A (JOHN J. ROOT), 24 April 1979 (24.04.79), see the whole document --	1-12

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

12 July 2001

Date of mailing of the international search report

13 July 2001 (13.07.01)

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 01/00194

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p data-bbox="316 304 1128 472">CN 1249622 A (YITONG SOFTWARE DEV CO LTD) 2000-04-05 (abstract) World Patents Index [online]. London, U.K.: Derwent Publications, Ltd. [retrieved on 2001-07-11]. Retrieved from: WPI Data.DW200034, Accession No. 2000-388398.</p> <p data-bbox="641 504 771 556">-- -----</p>	1-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

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